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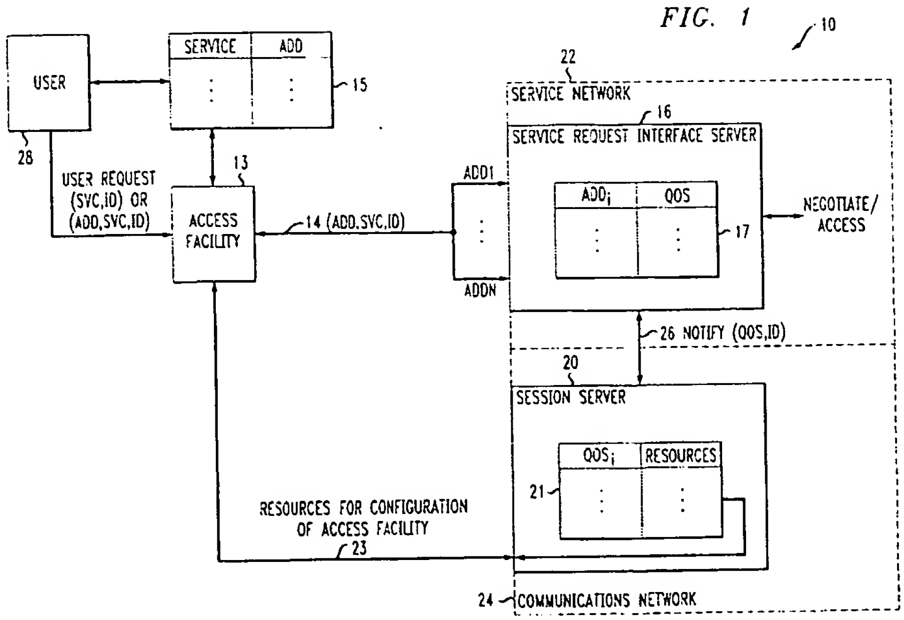
(54) Session subscription system and method for same

(57) A method is provided for selecting an optional quality of service (QOS) in a communications network. The method permits the user to make a specific QOS decision every time the network is accessed. The system provides the user with an interface address for every level of QOS. The user automatically makes a QOS decision by selecting an interface address. A relationship is also created between the requested QOS and the network resources available to support the QOS. Likewise, a relationship is established between the cost of using each QOS level and a fee schedule. The user is billed on an on-demand basis for a specific QOS session, in response to selecting an address. A session server is used to check subscriber credentials and subscription status of the user when requesting a service. The session server also allocates the resources of the network elements to support a user's requested QOS level. A system for automatically selecting a QOS level in response to the choice of an interface address is also provided.

FIG. 1



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Description

Background

[0001] This invention generally concerns network services and, more particularly, a system and method for a user to selectively request network service options for user-initiated sessions.

[0002] Quality of service (QOS) is a factor of increasing importance in network operations. Generally, QOS is a guarantee of a level of performance that is made to a user who uses a network such as the Internet for access to the service. The service may be communications, processing, or both. Increasingly, users are afforded an election of a QOS level when accessing a service. In this regard, see, for example Minoli and Schmidt's *Internet Architecture* (New York: Wiley & Sons) 1999, "Part Three QOS Support on the Internet: Technologies and Protocols". A guaranteed QOS is generally only possible when all network elements in an end-to-end link necessary to provide the service actively participate in a negotiation process and reserve the necessary network resources to deliver the QOS. When some network elements are not able to participate in such negotiations, whether due to architecture, protocols, or cost, a guaranteed QOS cannot be delivered.

[0003] All communication networks have constraints upon the service quality of the links that can be provided between elements in the network. Airlink elements in a network typically have constraints related to channel access, delay, and bandwidth. The hardwired or fiber optic components of a network can exhibit capacity limitations, especially when a large number of users seek access to the network. However, such capacity limitations can be addressed, at least partially, by controlling levels of QOS in the network. Often times, one user's QOS can be downgraded to accommodate another user without significant degradation in service to the one user, such as when a user's email delivery is delayed to permit the sending of another user's real-time video data.

[0004] Even if some or most elements of a network can be made responsive to user demands for QOS options, the problem remains of guaranteeing a QOS level through all elements of the network. Further, the QOS level guarantee must be maintained by the network as different elements in the network are replaced or upgraded.

[0005] Some users demand a high level of service, and pay accordingly for it. However, it is wasteful of resources to use high throughput, wide bandwidth, links when they are not necessary, such as in communications with other users who specify lower, or no, QOS levels. Likewise, it is uneconomical to establish multiple links between a user and a network to make a variety of QOS levels available to the user.

[0006] Therefore, it would be advantageous to provide a selectable QOS when a user seeks communication network services through a resource-limited network.

[0007] It would be advantageous if a communication network having QOS limitations would permit the user the option of selecting a QOS level from a field of QOS services.

[0008] It would be advantageous to provide a communication network service level that is responsive to a user's specification.

[0009] It would be advantageous if the service level of a communications network could be made optional.

[0010] It would be advantageous if rational QOS level choices could be offered by building a relationship between the QOS level and billing and rate plans.

[0011] It would be advantageous to provide a mechanism for the user to communicate desired QOS using native data addressing and transmission protocols within a network and not have to rely on specific protocols meant for QOS requests and negotiation.

Summary of the Invention

[0012] This invention enables non-negotiating network elements to enter into a QOS-negotiated end-to-end link, with the negotiated QOS level approaching, or reaching a desired or specified QOS. A user participates in the process by creating a session whose service type is consistent with a QOS level required by an application or protocol to be run over that session.

[0013] Accordingly, a method is provided for transferring information in a network at a requested QOS level. The method includes:

- generating a switching map, with relationships between a list of service request addresses in the network and a list of QOS levels offered for the transfer of information through the network;
- selecting a service request address; and
- receiving a QOS level corresponding to the selected service request address.

[0014] The communication paths for requesting the QOS can be different communication links from those used to transfer the information which is the subject of the QOS request. For example, the address can be entered to a service request network via a telephone, with the data communications link that is the subject of the request being a cable TV service. The dialing of a specific phone number corresponds to selecting a desired cable TV program or channel. A service (or function) in a communications network, responsive to the dialed number, is responsible for allocating the resources necessary with the cable company to provide communicating at the requested QOS level.

[0015] Alternately, the link used to provide the QOS address is the same as the data link. For example, dialing an Internet address from a PC to request a service level from an Internet Service Provider (ISP). The requested service is received on the same line used to

enter the address.

[0016] The system of the present invention can be embodied thought the use of three main components. An access facility interfaces with a user. The user seeks a specific level type of service from the access facility. Using the access facility, a request is made to a service request server for a QOS. The service request server has a plurality of addresses, each address corresponds to a different QOS. The QOS is selected in response to the address used to interface the service request server to the access facility. For example, the access facility may be a telephone. A user dials a telephone number corresponding to a service request server input address. Different telephone numbers are used to request different QOS levels of service.

[0017] The system also includes a session server in communication with the service request server. The session server receives a request for a specified QOS. The session server determines the resources available for use with the access facility, and allocates resources sufficient to support the requested QOS. The advantage of the system is that only the session server need be updated as the access facility is updated or changed, or if the user's rights to use the access facility change. Further, the session server can be used to allocate resources in more than one kind of access facility. In fact, the session server can be used to allocate resources for user services in multiple communication networks at the same level of service. Such a function supports a network tunneling function, such as when messages, originated in a private access facility, are passed through a public access facility communications link. The session server maintains a record of resources in both the private and public access facilities, and is able to allocate resources in both access facilities to provide a consistent QOS as service is extended across both networks. The session server can also be used to check the subscription status and subscription services enjoyed by the user. The requested QOS is allocated and billed in response to the subscription check.

Brief Description of the Drawings

[0018] Fig. 1 is a block diagram schematic of the present invention system for automatically requesting a quality of service (QOS) level in the transfer of information.

[0019] Fig. 2 illustrates an aspect of the invention of Fig. 1 where an auxiliary access facility is used.

[0020] Fig. 3 illustrates an aspect of the invention of Fig. 1 where the first access facility is a wireless communications network.

[0021] Fig. 4 illustrates an aspect of the invention of Fig. 1 where a QOS is established across communication networks to permit tunneling at a consistent level of service.

[0022] Fig. 5 is a flowchart illustrating the present invention method for transferring information at a requested quality of service (QOS).

Detailed Description of the Preferred Embodiment

[0023] The invention concerns a session-based feedback mechanism that determines the quality level for a service requested by a user via a service network and automatically configures the facilities through which the user accesses the service network. Based upon the type of service requested, the user's access facilities are automatically configured to operate in such a manner as to support the requisite QOS level. The feedback mechanism bypasses the user's access facilities in a QOS negotiation while ensuring that they will support the requisite QOS level.

[0024] Fig. 1 is a block diagram schematic of the present invention system for automatically requesting a quality of service (QOS) level in the transfer of information. The system 10 includes an first access facility 13 through which a user submits a request for a selectable service to be obtained by way of a service network 22. The first access facility 13 communicates on a network 14 with a service request interface server 16 that is a recognized and addressable element in the service network 22. The first access facility 13 provides a first address on line 14 that corresponds to a first service. In a fundamental aspect of the invention, a human operator uses the first access facility 13 to communicate the selection of an address at the service request server 16. Then, an address in service network 22 is used to represent a specific QOS level. In more sophisticated aspects of the invention the access facility translates the requirement of a user, human or machine, into an address selection that is communicated to service request server 16. Without intending any limitation, the first access facility 13 is a landline telephone, cable modem, mobile wireless, fixed wireless, and public Internet system in different aspects of the invention.

[0025] The service request interface server 16 has a first plurality of address inputs selectably connectable to the output of the first access facility on line 14. These addresses are represented as ADD1 through ADDN in Fig. 1. The service request server 16 includes a connection 26 which provides a first QOS corresponding to the first address. The service request server 16 has a connection 26 with a session server 20, that is a component of a communication network 24. The session server 20 receives the first QOS from the service request server and provides, via an interface 23 with the first access facility 13, a first resource allocation corresponding to the first QOS. The first access facility 13 receives the first resource allocation on interface 23 and provides first service in response to receiving the first resource allocation from the session server 20.

[0026] The first access facility 13 maintains, or has access to, a service access map 15 which relates services requested by a user to an address in a plurality of addresses that are recognized by the service request

interface server (hereinafter "server 16"). That is, the first access facility 13 includes a database 15 of a first plurality of services cross-referenced with a first plurality of service request server addresses. In one aspect of the invention, a machine, PC, or human user 28 maintains, or has access to map 15, so that the address is selected by user 28. For example, the service access map 15 may be even be a list written on paper, or committed to memory by human operator 28. Then, the QOS level is chosen as a direct consequence of the user selecting an address that is known to correspond to the desired service. Regardless of whether the address is selected by user 28 or access facility 13, the address is passed to service request server 16 on line 14 to select a QOS.

[0027] The server 16 maintains, or has access to, a map 17 that relates the service request server addresses to quality of service levels that can be negotiated with elements of the service network 22 for access to services at defined QOS levels. That is, the service request server 16 includes a database 17 of a first plurality of addresses cross-referenced with a first plurality of QOS levels.

[0028] Likewise, the session server 20 (hereinafter "server 20") maintains, or has access to, a map 21 that relates the QOS levels of the map 17 to resources that are available for configuration of the first access facility 13. That is, the session server 20 includes a database 21 of a first plurality of QOS levels cross-referenced with a first plurality of first access facility resource allocations. The resources include, without limitation, algorithms and rules by which the first access facility 13 (or components thereof) can be configured in order to service communications between a user acting through the first access facility 13 and the server 16 in a manner that is necessary and sufficient to support a QOS level signified by a service request server address.

[0029] In operation, a user request for service on the service network 22 is received by the first access facility 13. The user request contains a designation of the service (SVC) and the ID of the user (SVC, ID). In this regard, the term user signifies not only a human, but also a machine or element such as a PC connected to the first access facility 13 which generates or forwards a service request. Based on the service identified in the request, the first access facility 13, using the map 15, determines a service request server address (ADD) of the server 16 with which to establish a session for access to the requested service. The user request is forwarded to the service request server as an address message (ADD, SVC, ID). As mentioned above, however, the user request is simply the address in the fundamental aspect of the invention (ADD, ID), such as when the user already "knows" the service (SVC) associated with the choice of address (ADD). The address may be an IP address, an Ethernet MAC address, TCP port number, or other identifier.

[0030] During the session, a particular QOS level is established and maintained. In response to initiation of a session through one of the service request server addresses, the server 16 consults the map 17 to determine a QOS level for services to be obtained on the service network 22 during the session. The server 16 negotiates with components of the service network 22 for the QOS level and maintains the negotiated capability throughout the session. At the same time, the server 16 notifies the server 20 on the connection 26 that a session has been established and provides the QOS level for the session and the ID of the user. The server 20, using the map 21, determines the resources that are necessary for the designated QOS level and, on communication line 23 provides the resources to the elements of the first access facility 13. These resources configure the elements of the first access facility 13, for example, by establishing a priority to give to traffic to and from the identified user. Such policies may include advancing higher priority packets to the head of queues, choosing to allocate more CPU resource to a higher priority packet, activating prioritized airlink channel access rules for higher priority packets, adjusting channel allocations, and enabling an airlink base station to allocate shared airlink resources appropriately among competing remote units (when the access facility 13 is a wireless communications network).

[0031] In Fig. 1, schematic representations of various elements are given. For example, the means by which the first access facility 13 and the servers 16 and 20 determine responses relating to QOS are illustrated as maps 15, 17, and 21. In fact, this is merely to assist in the description of the invention since tables, trees, linkages, algorithms, or processes can be used to establish the relationships that are illustrated by the maps.

[0032] Fig. 2 illustrates an aspect of the invention of Fig. 1 where an auxiliary access facility 50 is used. The auxiliary access facility 50 is used to communicate the address, and hence the desired QOS, to the service request server 16 via line 14. However, the service is being requested for first access facility 13. The service typically corresponds to the throughput or delay associated with data service link 52 on which information is transferred. For example, the auxiliary access facility 50 may be a telephone, with link 14 being a public telephone line. The telephone 50 can be used to order special services for first access facility 13 which may be cable TV service. Note, in various aspects of the invention the data line being serviced to a specified QOS can be a separate line, as line 52, or transfer of information may occur on line 14, the line used to select the QOS address, as shown in Fig. 1.

[0033] Fig. 3 illustrates an aspect of the invention of Fig. 1 where the first access facility 13 is a wireless communications network. Wireless network 13 includes a remote wireless communications unit 54 and a mobile switching center 56. The airlink between remote unit 54 and MSC 56 is used to request addresses and to transfer information at a requested level of service. The wire-

less communications network 13 transfers information to a user telephone or PC 57. Because of contention with other remote units in the system 13 (not shown), the airlink may be the most constricting part of the communications network. This contention between units may make it desirable to prioritize communications to and from these remote units. The session server 20 allocates resources in the wireless network 13 which include bandwidth allocation, remote unit channel access privileges, the resequencing of queued data, and scheduled time allocations. The differences in resource allocation by the access facility 13 result in services which include non-real time, real-time, low delay, high throughput information transfers, and combinations of the above-mentioned services. It should be noted that the resource allocation and service specifics are merely listed as examples, and neither are they limited to use in just the wireless network access facility 13 aspect of the invention.

[0034] The session server 20 distributes directives to the network management elements of access facility 13 which result in algorithms, policies, and defined types of service to be provisioned in the remote unit 54 and MSC 56. The remote unit 54 and MSC 56 use this provisioned information to classify traffic by type of service and execute the required algorithms and policies to deliver the required grade of service.

[0035] Fig. 4 illustrates an aspect of the invention of Fig. 1 where a QOS is established across networks to permit tunneling at a consistent level of service. A second access facility 60 is included to provide selectable information transfer services. The second access facility 60 has an input on line 62 connected to the output of the session server 20, and an input on line 52 connected to the output of the first access facility 13. The session server 20 provides a first resource allocation to the second access facility 60 in response to receiving the first QOS on line 26 from service request server 16. As mentioned above, the map 21 which is maintained (or accessed by) the session server 20, cross references the QOS levels with resource allocations to the first access facility 13. A similar map is maintained to cross reference the QOS levels with resource allocations in the second access facility 60. In this way a common QOS can be obtained for both system. That is, the first service (originally established for the first access facility 13) is continued from the first access facility 13 through the second access facility 60 on data lines 64 at a consistent QOS level.

[0036] For example, the second access system 60 is an ISP. A user requesting a certain level of server in the ISP through the first access facility 13 would seek to maintain that quality of service in all the connecting links. The present invention supports such tunneling concepts by maintaining a session server database that can be configured to support multiple, and connecting communications networks.

[0037] Tunneling is a mechanism used to transport data expressed in "Format A" through an access facility that can only carry "Format B". This is done by wrapping Format A inside Format B packets such that the desired data traverses the Format B access facility successfully and emerges on the other side for further handling. With the Internet, a user could be operating a first access facility 13 where "private" IP addresses are a large part of the infrastructure that would be invalid in the second access facility 60 (i.e., a public Internet network). Subscribers (i.e., a subscriber's PC) to the first access facility 13 would also have legal "public" addresses that are valid in the second access facility 60. That is, the subscriber's PC has both a public (for access facility 60) and a private address (for access facility 13) for participation in both networks. Tunneling is used to temporarily wrap the publicly addressed packets (in second access facility 60 on line 64) inside packets with private addresses in order to "tunnel" the packets through the first access facility 13 on line 52 to be released to the PC 57 with the public address, or to the public Internet 60 after passage through the first access facility 13.

[0038] Session server 20 has the capacity to operate in multiple networks. As above, session server 20 permits a user to enjoy a requested level of QOS without the need of special QOS-supporting negotiation protocols used in a closely related or privately controlled access facility 13. However, the present invention concept can also be applied to access facilities not under the control, or directly linked, to the session server 20, such as second access facility 60. The session server 20, if enabled with protocols sufficient to negotiate with access facility 60, can request, negotiate, and extend the QOS being enjoyed in the first access facility 13 to the second access facility 60.

[0039] In some aspects of the invention, line 62 is unnecessary for the delivery of resource allocation instructions which directly control the second access facility 60. Alternately, connection 62 is a public network, such as a telephone line. In another alternative, resource allocations are delivered to access facility 13, and transferred on line 52, to second access facility 60. For example, when second access facility 60 represents a public Internet network, elements in the packet header are used to implicitly identify all of the potential protocols and applications that should enjoy a particular grade of service. Such services are provided without knowledge of current, or future protocols and application. As new protocols and applications emerge, they can be mapped into existing types of service, or into a new type of service to be defined. The new type of service is invoked as any previous type, by establishing a session with a specific session server 20. A second novelty is the linkage of the type of service with the subscription information to manage resources at the affected network elements.

[0040] Although session server 20 is depicted in Fig. 4 as having a single map 21 for cross referencing QOS to resources, such a service could also be embodied as a series of parallel servers, one session server for each

access facility. Then, only the session server supporting a specific access facility would need to shut down for updating as the corresponding access facility was reconfigured.

[0041] In some aspects of the invention the session server 20 includes a database 21 of a first plurality of fees cross-referenced to the first plurality of QOS level. The session server 20 generates a first session service bill in response to the selection of the first QOS level. Specifically, fee information is communicated on line 66 to a billing server 68. Billing server 68 generates a bill to the user of the first access facility 13 on line 70. In some aspects of the invention a separate session server is maintained to cross reference fees and QOS levels, independent of the cross-referenced list of QOS levels and resource allocations of map 21.

[0042] Returning briefly to Fig. 1, in some aspects of the invention the first access facility 13 supplies a first user identity (ID) to the service request server 16 on line 14 when the first address is submitted. The service request server supplies the first user identity, with the first QOS, on line 26 to the session server 20. Returning again to Fig. 4, the session server 20 checks the first access facility subscription status and subscription type associated with the first user, and allocates resources in response to the subscription checking. That is, session server 20 maintains the fee schedules associated with each level of QOS. The session server 20 sets into motion procedures (session service bill) to charge the user a subscription fee based on the requested, and delivered, QOS. In some cases, the user is alerted to the fees as the service is used. The subscription status of a remote user is, likewise, monitored as a result of the generation of a session service bill. In some aspects of the invention session server maintains, or has access to, a cross-referenced database (map) of user IDs and available resources, such as map 21 to perform the above-mentioned tasks.

[0043] Fig. 5 is a flowchart illustrating the present invention method for transferring information at a requested quality of service (QOS). Although the following process is numbered in the interest of clarity, no order should be inferred from the numbering unless explicitly stated. Step 100 provides information for transfer. Step 102 establishes a relationship between a first plurality of addresses and a first plurality of QOS levels for the transfer of information. Step 104 selecting a first address. In Step 106 a first service is received which permits the transfer of information at a first QOS level corresponding to the first address. The reception of the first service in Step 106 includes a service selected from the group of services consisting of non-real time, real-time, low delay, high throughput information transfers, and combinations of the above-mentioned services. Step 108 is a product, where resource facilities are automatically configured in response to the selection of an address.

[0044] Step 100 provides a service network, or a service request server, and a communications network, or a session server. Then, the establishment of a relationship between the address and QOS in Step 102 includes accessing a map in a service request server which relates each address to a QOS that can be negotiated with a session server. Some aspects of the invention comprise further steps. Step 105a, in response to selecting the first address, requests the first QOS level from the session server.

[0045] Typically, Step 100 includes a first access facility to provide information transfer services, and includes further steps. The first access facility can be a landline telephone, cable modem, mobile wireless, fixed wireless system, or public Internet system, in various aspects of the invention. Optionally, Step 103a establishes a relationship between a first plurality of services and a first plurality of service request server addresses, and Step 103b selects a service corresponding to the first address. The establishment of a relationship between services and service request server addresses in Step 103a includes accessing a service access map in the access facility which relates each service to an address in the service request server. Alternately, the process is initiated in Step 104, such as when a when already knows the address to select for the required service.

[0046] Step 105b establishes a relationship between a first plurality of access facility service resources and a first plurality of QOS levels. The establishment of a relationship between access facility service resources and QOS levels in Step 105b includes accessing a map in the session server which relates QOS levels to services that are available for configuration of the access facility. Step 105c allocates first access facility resources to provide a first service in response to requesting the first QOS in Step 105a.

[0047] In some aspects of the invention a further step precedes the selection of the first address in Step 104. In Step 103c a user identification is provided. Then, the selection of the first address in Step 104 includes providing the user identification to the service request server. The requesting of the first QOS in Step 105a, likewise, includes providing the user identification to the session server. The allocation of access facility resources in Step 105c is responsive to the user identification provided. Specifically, the session server checks the user's access facility subscription status and subscription type, and allocates access facility resources in response to the subscription check.

[0048] In some aspects of the invention Step 100 provides at least one remote wireless communication unit. The allocation of service resources in Step 105c includes selecting priorities from the group consisting of bandwidth allocation, remote unit channel access privileges, resequencing of queued data, and scheduled time allocations.

[0049] In another aspect of the invention Step 100 a second access facility in addition to the first. The establishment of a relationship between a first plurality of addresses and a first plurality of QOS levels for the transfer

of information in Step 102 includes establishing a relationships with a first plurality of QOS levels in both the first and second access facilities. The allocation of resources in Step 105c includes allocating second access facility resources to provide a first service in the second access facility, in response to requesting the first QOS, in addition to allocating first access facility resources to provide a first service in the first access facility. The reception of the first service in Step 106 permits the transfer of information at a first QOS level corresponding to the first address from the first access facility to the second access facility. That is, the first service is continued from the first access facility to the second access facility. Then, the method includes a further step. Step 110 tunnels information from the first access facility through the second access facility at a consistent QOS.

[0050] The above-described invention is "future-proof. Any current or future application, as long as it uses the underlying network protocol used to establish a currently existing relationship between the PC and session server (i.e. a session), will enjoy the QOS set for that session. Although the invention has been characterized as employing a session server to provide a QOS level responsive to an address selection, the present invention concept is applicable to any other means of selectably or switchably providing a requested QOS level for a specific interface session. Other variation and embodiments of the present invention will occur to those skilled in the art.

Claims

1. A method for transferring information at a requested quality of service (QOS), the method comprises:

   establishing a relationship between a first plurality of addresses and a first plurality of QOS levels for the transfer of information;
   selecting a first address; and
   receiving a first service permitting the transfer of information at a first QOS level corresponding to the first address.

2. The method of claim 1 wherein a service request server and a session server network are provided, and in which the establishment of a relationship between the address and QOS includes accessing a map in a service request server which relates each address to a QOS that can be negotiated with a session server.

3. The method of claim 2 further comprises:
   in response to selecting the first address, requesting the first QOS level from the session server.

4. The method of claim 3 wherein a first access facility provides information transfer services, and further comprises:

   allocating first access facility resources to provide a first service in response to requesting the first QOS.

5. The method of claim 4 further comprises:
   establishing a relationship between a first plurality of access facility service resources and a first plurality of QOS levels.

6. The method of claim 5 in which the establishment of a relationship between access facility service resources and QOS levels includes accessing a map in the session server which relates QOS levels to services that are available for configuration of the access facility.

7. The method of claim 6 further comprises, preceding the selection of the first address:

   establishing a relationship between a first plurality of services and a first plurality of service request server addresses; and
   selecting a service corresponding to the first address.

8. The method of claim 7 in which the establishment of a relationship between services and service request server addresses includes accessing a service access map in the access facility which relates each service to an address in the service request server.

9. The method of claim 8 further comprises, preceding the selection of the first address:

   providing a user identification; and
   in which the allocation of access facility resources is responsive to the user identification provided

10. The method of claim 9 in which the selection of the first address includes providing the user identification to the service request server:

    in which the requesting of the first QOS includes providing the user identification to the session server; and
    in which the session server checks the user's access facility subscription status and subscription type, and allocates access facility resources in response to the subscription check.

11. The method of claim 3 wherein the first access facility is selected from the group consisting of landline telephone, cable modem, mobile wireless, fixed wireless systems, and public Internet systems.

12. The method of claim 11 wherein at least one access facility remote wireless communication unit is provided, and in which the allocation of service resources includes priorities selected from the group consisting of bandwidth allocation, remote unit channel access privileges, resequencing of queued data, and scheduled time allocations.

13. The method of claim 3 wherein a second access facility is provided, in which the allocation of resources includes allocating second access facility resources to provide a first service, in both the first and second access facilities, in response to requesting the first QOS;

in which the reception of the first service permits the transfer of information at a first QOS level, corresponding to the first address, from the first access facility to the second access facility; and
further comprises:
tunneling information from the first access facility through the second access facility at a consistent QOS.

14. The method of claim 1 in which the reception of the first service includes a service selected from the group of services consisting of non-real time, real-time, low delay, high throughput information transfer, and combinations of the above-mentioned services.

15. A system for automatically requesting a quality of service (QOS) level in the transfer of information, the system comprising:

a first access facility to provide a selectable service;
a service request server having a first plurality of address inputs, and an output port to provide a first QOS corresponding to a first address; and
a session server having an input connected to said service request server to receive the first QOS, and an output to provide a first resource allocation corresponding to the first QOS.

16. The system of claim 15 in which said first access facility has an input connected to said session server output to receive the first resource allocation, said first access facility providing the first service in response to receiving the first resource allocation.

17. The system of claim 16 in which said service request server includes a database of a first plurality of addresses cross-referenced with a first plurality of QOSs.

18. The system of claim 16 in which said session server includes a database of a first plurality of QOSs cross-references with a first plurality of access facility resource allocations.

19. The system of claim 16 in which said first access facility includes a database of a first plurality of services cross-referenced with a first plurality of service request server addresses, and an output to provide a first address corresponding to a first service.

20. The system of claim 16 further comprising:

a second access facility to provide a selectable service, having an input connected to the output of said session server and an input connected to the output of said first access facility;
in which said session server provides a first resource allocation to said second access facility in response to receiving the first QOS; and
in which the first service is continued from said first access facility through said second access facility at a consistent QOS level.

21. The system of claim 16 in which said first access facility is a wireless communications network including a remote unit and a Mobile Switching Center (MSC);

in which said session server allocates resources selected from the group consisting of bandwidth allocation, remote unit channel access privileges, resequencing of queued data, and scheduled time allocations.

22. The system of claim 16 in which said first access facility is selected from the group consisting of landline telephone, cable modem, mobile wireless, fixed wireless systems, and public Internet systems.

23. The system of claim 16 in which said access facility services are selected from the group consisting of non-real time, real-time, low delay, high throughput information transfer, and combinations of the above-mentioned services.

24. The system of claim 19 in which said first access facility supplies a first user identity to said service request server, with the first address;

in which said server request server supplies the first user identity to said session server, with the first QOS;
in which the session server checks the first access facility subscription status and subscription type associated with the first user, and allocates resources in response to the subscription checking.

25. The system of claim 24 in which said session server includes a database of a first plurality of fees cross-referenced to the first plurality of QOS levels, and in which said session server generates a first session service bill in response to the selection of the first QOS level.

FIG. 1

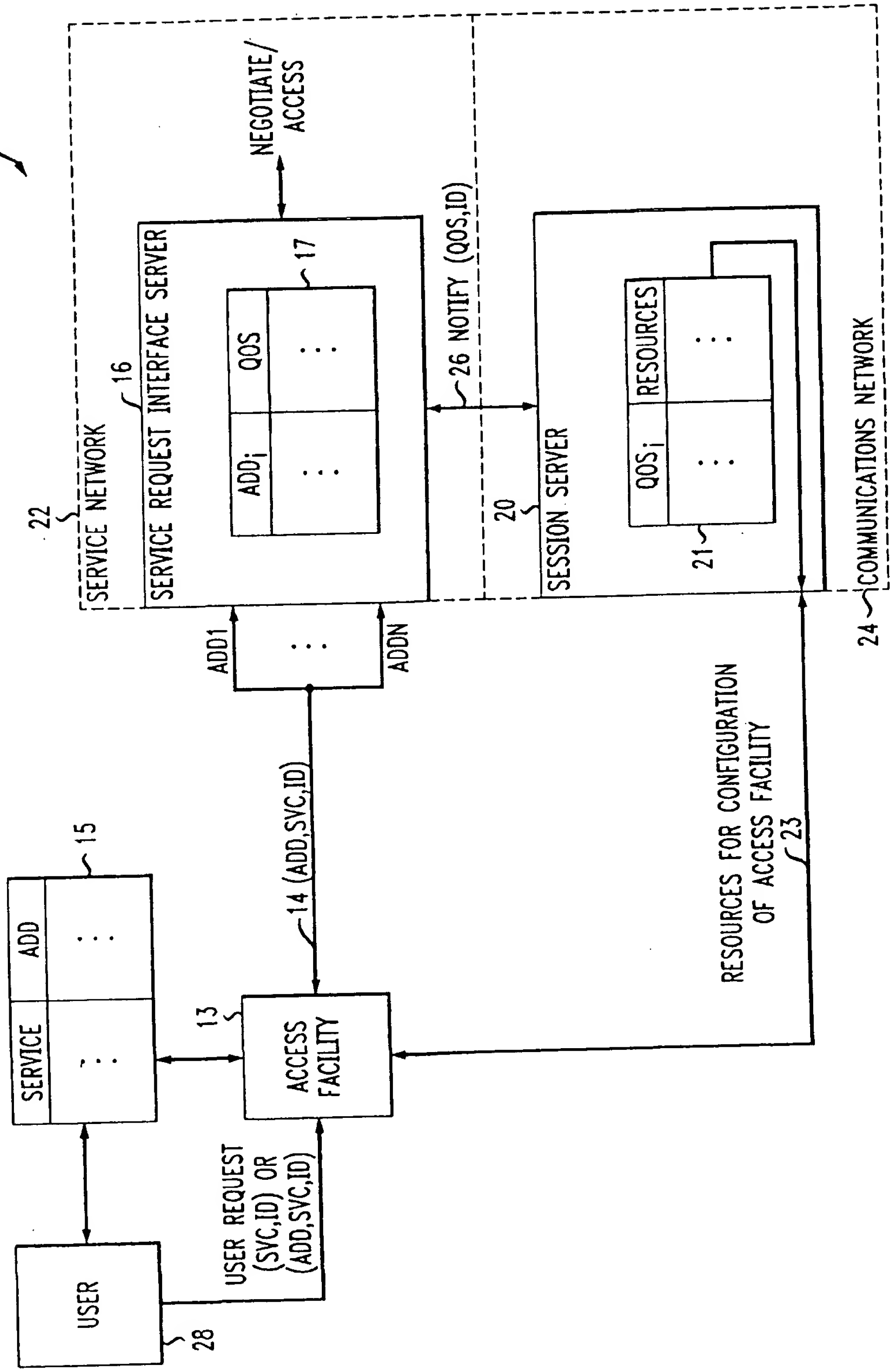

10
NEGOTIATE/ ACCESS
22
SERVICE NETWORK
16
SERVICE REQUEST INTERFACE SERVER
17
ADD$_i$
QOS
26 NOTIFY (QOS,ID)
20
SESSION SERVER
21
QOS$_i$
RESOURCES
COMMUNICATIONS NETWORK
24
ADD1
ADDN
14 (ADD,SVC,ID)
15
SERVICE
ADD
13
ACCESS FACILITY
RESOURCES FOR CONFIGURATION OF ACCESS FACILITY
23
USER
28
USER REQUEST (SVC,ID) OR (ADD,SVC,ID)

FIG. 2

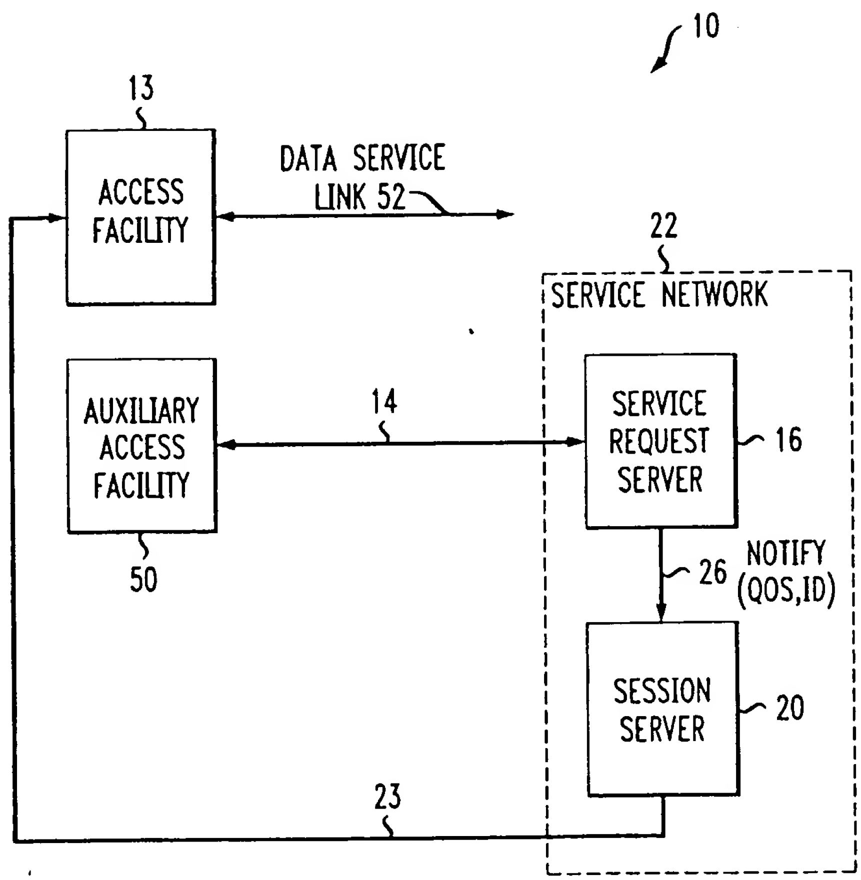
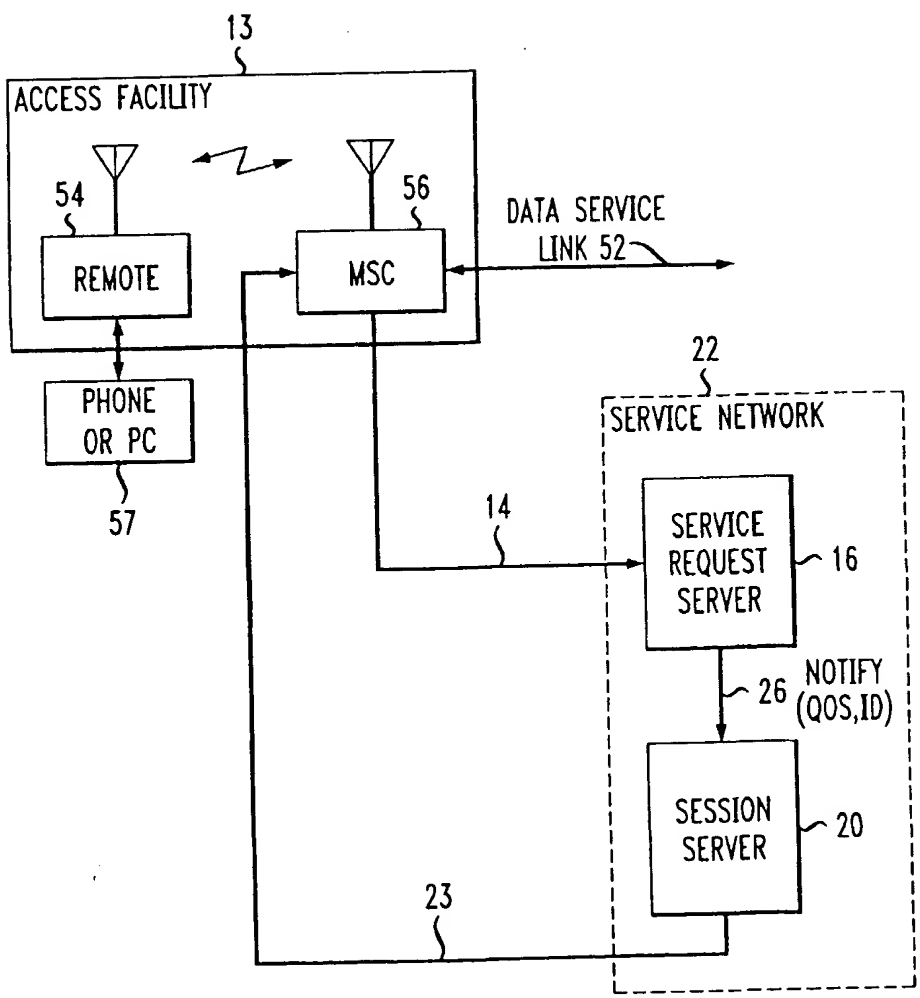

10
13
ACCESS FACILITY
DATA SERVICE LINK 52
22
SERVICE NETWORK
AUXILIARY ACCESS FACILITY
14
SERVICE REQUEST SERVER
16
50
NOTIFY (QOS,ID)
26
SESSION SERVER
20
23

FIG. 3


13
ACCESS FACILITY
54
56
REMOTE
MSC
DATA SERVICE
LINK 52
PHONE
OR PC
57
22
SERVICE NETWORK
14
SERVICE
REQUEST
SERVER
16
26
NOTIFY
(QOS,ID)
SESSION
SERVER
20
23

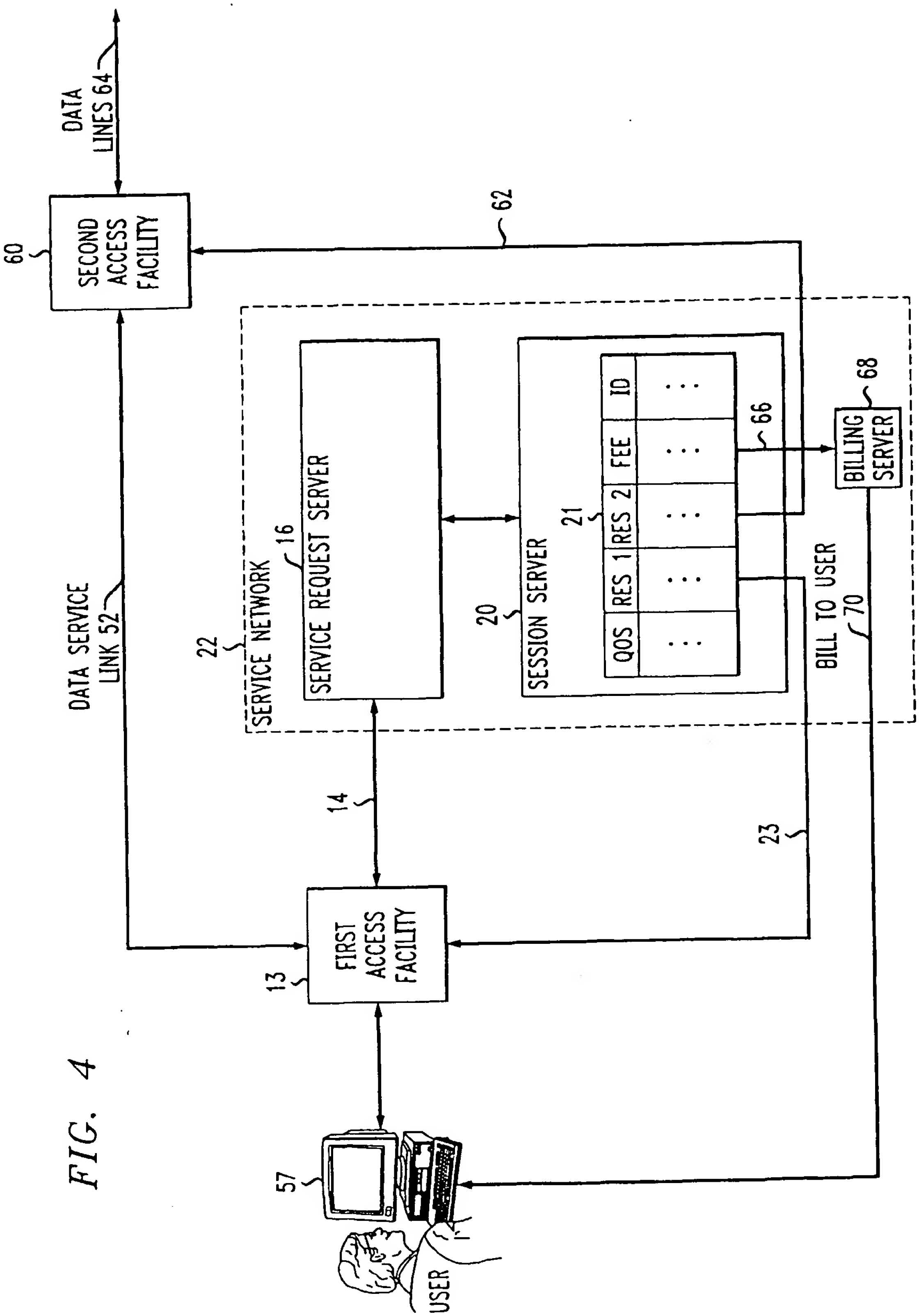
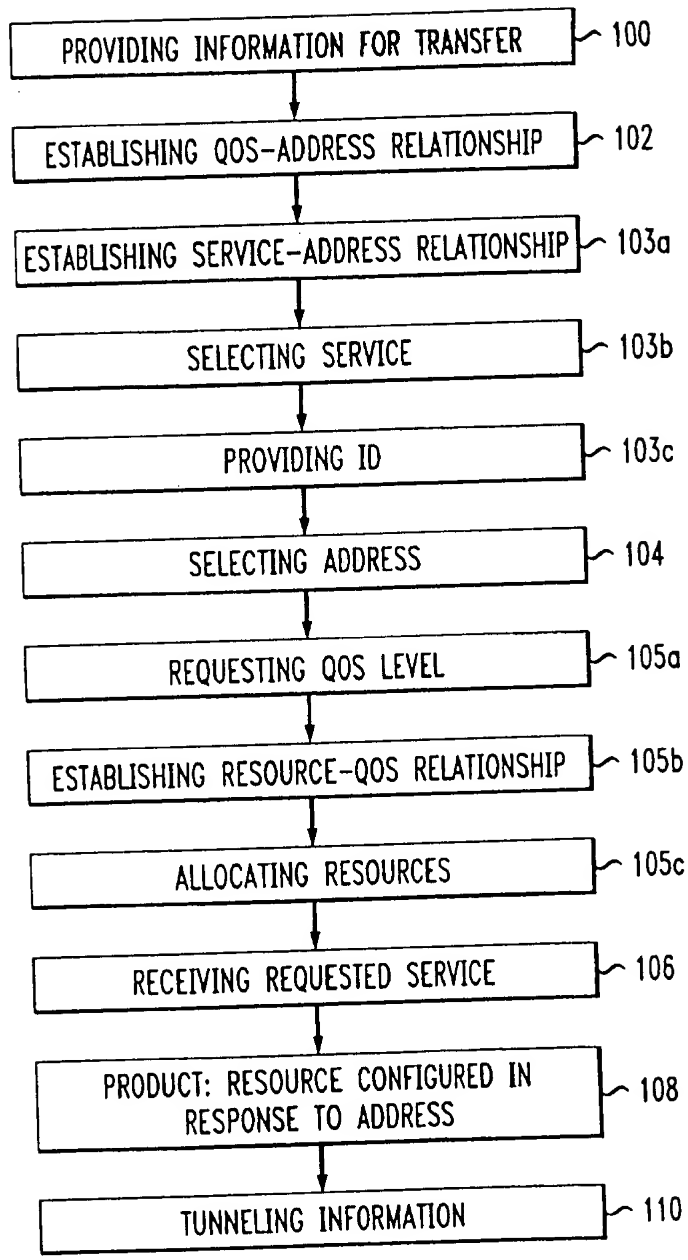

DATA LINES 64
SECOND ACCESS FACILITY
60
62
DATA SERVICE LINK 52
22
SERVICE NETWORK
16
SERVICE REQUEST SERVER
20
SESSION SERVER
21
QOS
RES 1
RES 2
FEE
ID
66
BILLING SERVER
68
BILL TO USER
70
14
23
FIRST ACCESS FACILITY
13
57
USER

FIG. 4

FIG. 5


PROVIDING INFORMATION FOR TRANSFER
100
ESTABLISHING QOS-ADDRESS RELATIONSHIP
102
ESTABLISHING SERVICE-ADDRESS RELATIONSHIP
103a
SELECTING SERVICE
103b
PROVIDING ID
103c
SELECTING ADDRESS
104
REQUESTING QOS LEVEL
105a
ESTABLISHING RESOURCE-QOS RELATIONSHIP
105b
ALLOCATING RESOURCES
105c
RECEIVING REQUESTED SERVICE
106
PRODUCT: RESOURCE CONFIGURED IN RESPONSE TO ADDRESS
108
TUNNELING INFORMATION
110